

**WAFER APPLIED FLUXING AND UNDERFILL MATERIAL, AND LAYERED
ELECTRONIC ASSEMBLIES MANUFACTURED THEREWITH**

ABSTRACT

A flip-chip type integrated circuit chip including a chip die having electrical contacts arranged in a predetermined pattern and capable of providing electrical interconnection with a carrier substrate is provided. The chip die includes a fluxing agent disposed on a surface of the electrical contacts, and a curable thermosetting underfill composition distinct from the fluxing agent and disposed in a flowable form over the chip die. Upon mating of the chip die with the substrate and heating, the electrical contacts flow and the thermosetting underfill composition cures, thus adhering the chip die to the substrate, forming a circuit assembly.

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